

NOVEMBER/DECEMBER 2024

**23PEMB14A — BIO INSTRUMENTATION**

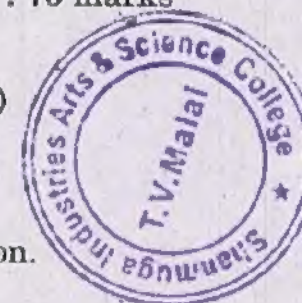
Time : Three hours

Maximum : 75 marks

**SECTION A — (10 × 2 = 20 marks)**

Answer ALL questions.

1. List out two applications of lyophilization.
2. Explain the function of a fume hood in a laboratory.
3. Identify the general principles behind chromatography techniques.
4. Categorize the types of chromatography based on the stationary phase.
5. Identify the principle behind moving boundary electrophoresis.
6. Recall electroendosmosis and its types.
7. Describe the electromagnetic spectrum and its importance.





8. Illustrate the working of immuno electrophoresis with a diagram.
9. Identify two applications of Scintillator counters.
10. Discuss the process of radioactive decay.

SECTION B — ( $5 \times 5 = 25$  marks)

Answer ALL questions.

11. (a) Discuss the design and functions of a pH meter.

Or

- (b) Compare the operating principles and applications of aerobic and anaerobic incubators.

12. (a) Evaluate the advantages and limitations of ultra-performance convergence chromatography.

Or

- (b) Elaborate on two-dimensional chromatography and its applications.

13. (a) Discuss the principles and applications of Western blotting.

Or

- (b) Compare and contrast horizontal, and vertical electrophoresis.

14. (a) Analyze the working principle of FTIR spectrophotometer and its advantages.

Or

- (b) Outline the principles and applications of FISH in molecular cytogenetics.

15. (a) Assess the safety protocols employed in laboratories using radio isotopic techniques.

Or

- (b) Define the principle and applications of tracer techniques in biology.

SECTION C — ( $3 \times 10 = 30$  marks)

Answer any THREE questions.

16. Discuss in detail about biosafety cabinets, their levels, applications, and limitations.
17. Elaborate on the Stimulated moving bed chromatography (SEC).
18. Discuss the principles and applications of Northern and Southern blotting.
19. Examine the principle, working and applications of ESR spectroscopy in detail.
20. Discuss the principles, instrumentation, and applications of Auto radiography.

